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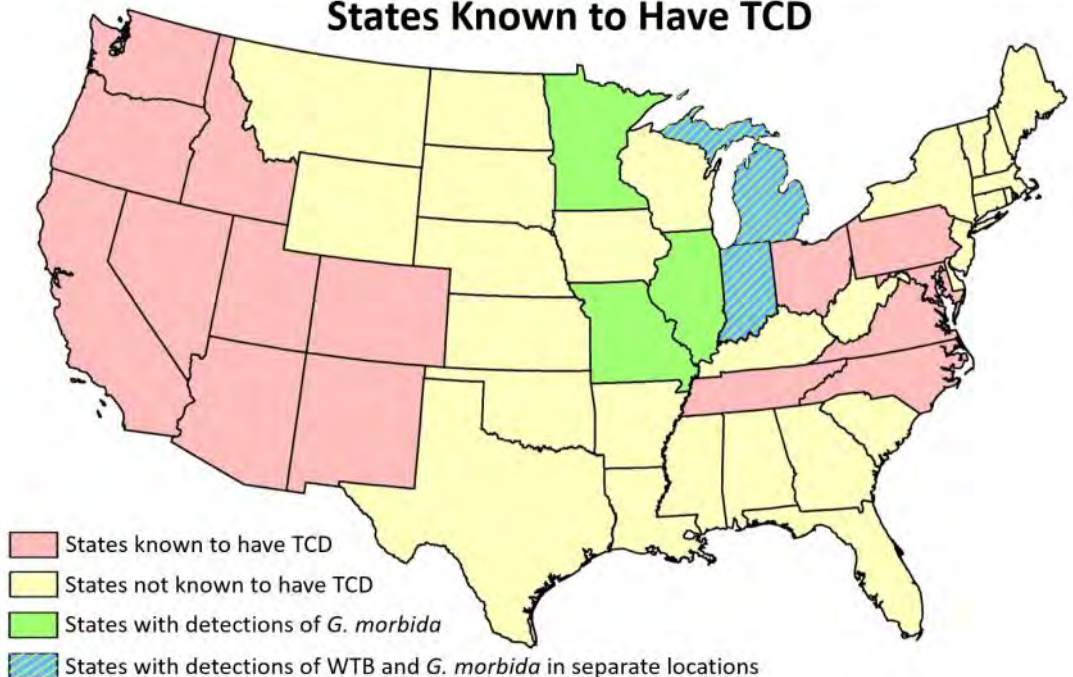
# Missouri Forest Health 2018 Update

Although not yet detected in Missouri, thousand cankers disease (TCD) remains a threat to the state's eastern black walnut resource. TCD occurs when the walnut twig beetle (WTB), *Pityophthorus juglandis*, attacks walnut trees and introduces the fungus *Geosmithia morbida*. The fungus causes small cankers to form in the phloem tissue under tree bark. When combined with the feeding activity of thousands of walnut twig beetles, trees begin to decline and may die. While *G. morbida* was recently found on several other walnut-feeding insects, the WTB has not yet been detected in Missouri, and the state is not known to have TCD.

There is concern that undetected TCD infestations could be present in Missouri, or that spread may occur when infested walnut wood is moved from other states, especially those where TCD has been detected (see map below). The Missouri Department of Agriculture has enacted a quarantine prohibiting walnut wood products and all firewood from coming into Missouri from states where TCD has been detected (<https://agriculture.mo.gov/plants/pests/thousandcankers.php>).

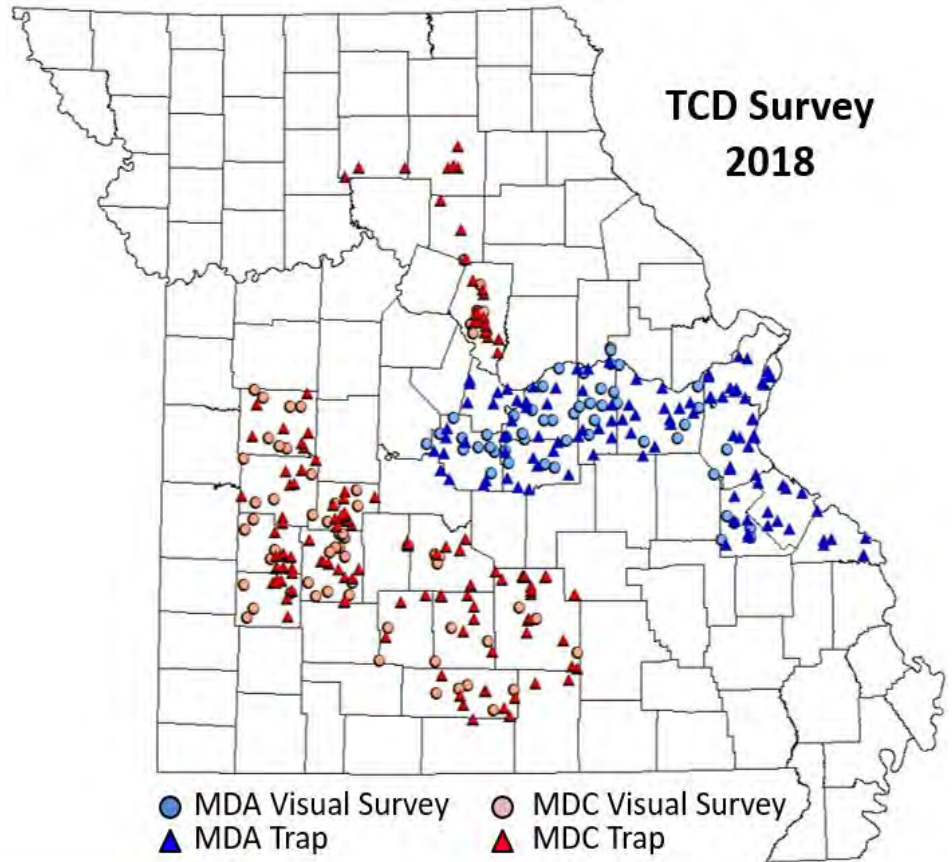
In Missouri, TCD is unlikely to be detected until several years after introduction, making reports of walnut tree dieback and decline very important. Visit [treepests.missouri.edu](https://treepests.missouri.edu) for more information on what to look for and how to report a suspect tree. Photos of suspect trees can also be emailed to [forest.health@mdc.mo.gov](mailto:forest.health@mdc.mo.gov) as a first step in determining what trees should be visited by trained personnel.

## States Known to Have TCD



# Thousand Cankers Disease Survey

In 2018, both the Missouri Department of Conservation (MDC) and the Missouri Department of Agriculture (MDA) conducted surveys for TCD using USDA Forest Service and USDA Farm Bill funding, respectively. Survey activities this year included 242 walnut twig beetle traps in walnut trees or at sawmill log piles, in addition to 356 visual surveys to identify potentially infested trees. Visual surveys were conducted in high-risk locations within 28 counties in central, eastern, and southwest Missouri. Branch samples were collected from highly suspect trees for lab evaluation and none had any evidence of TCD. Analysis of trap catches resulted in no evidence of walnut twig beetle at survey locations. Survey efforts are rotated to different regions each year. Since 2010, there have been 2,569 locations visually surveyed and 1,268 WTB traps deployed.

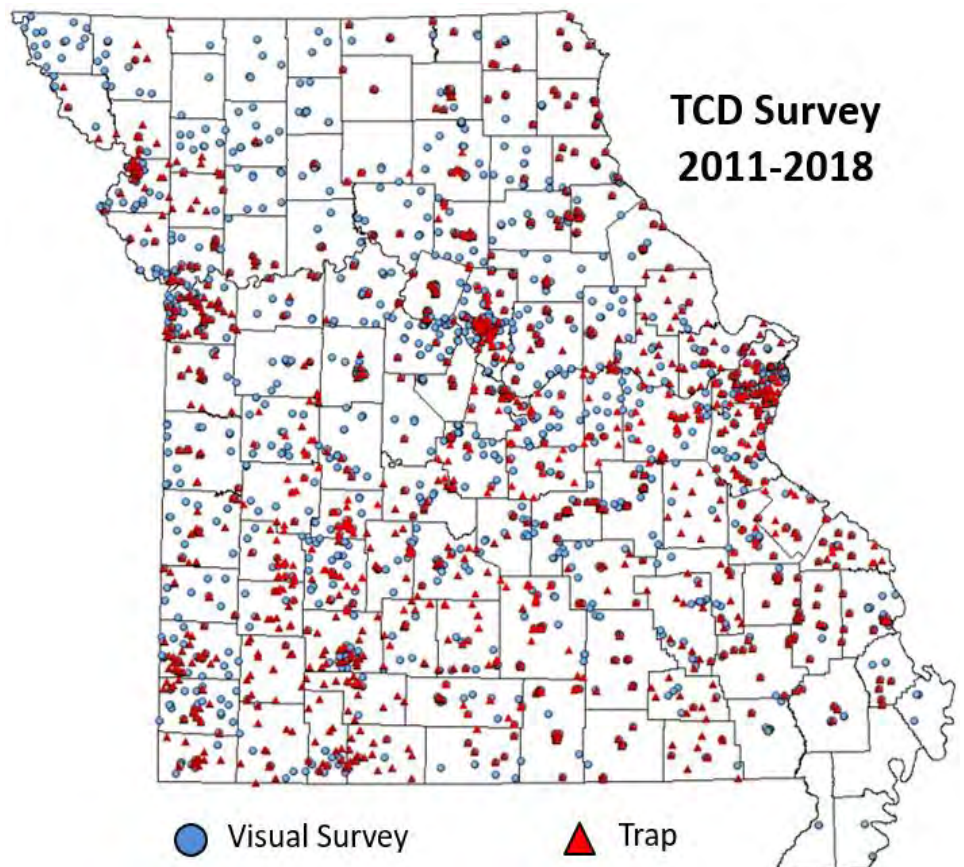


***The walnut twig beetle is about the size of the "I" on a dime.***

*Photo: MDC*



**Walnut twig beetle trap.** *Photo: MDC*





# Geosmithia morbida Detected in Missouri

Thousand cankers disease (TCD) has been a concern for Missouri's native black walnut trees since 2008 when the issue was first discovered in Colorado. The disease is caused by the tiny walnut twig beetle, *Pityophthorus juglandis*, and a fungus (*Geosmithia morbida*) it carries to walnut trees. While the walnut twig beetle has not been found in Missouri, *G. morbida* has recently been detected in several locations throughout the state. These detections were part of a cooperative research project between the Missouri departments of Agriculture (MDA) and Conservation (MDC) and the University of Missouri Plant Diagnostic Clinic with funding provided by the US Department of Agriculture's Farm Bill program.

Missouri's recent *G. morbida* detections were made through genetic analysis of several beetle species collected by MDA and MDC during walnut twig beetle trapping efforts in 2016 and 2017. Ongoing research in some eastern states has shown that *G. morbida* can be found on many walnut-feeding beetle species (both native and exotic). Through detections in our state and others, research suggests that *G. morbida* is a common, widespread, and potentially native species.

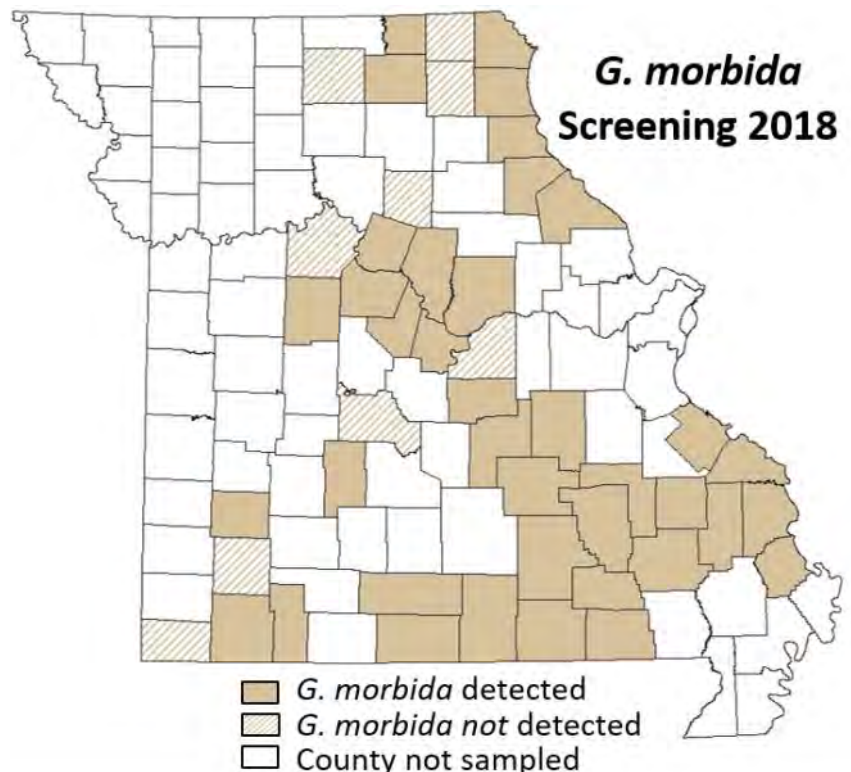
So, what does this news mean for Missouri's walnuts? The good news is that on its own, *G. morbida* is not known to kill walnut trees. For TCD to develop on a walnut tree, walnut twig beetles must introduce *G. morbida* under the bark—the fungus is not known to cause cankers on trees without the help of walnut twig beetle (other beetle species are not thought to be good vectors). Since the walnut twig beetle has not been found in Missouri, we do not think that *G. morbida* poses a threat to our walnut trees at this time. There will be no regulatory actions or quarantines resulting from the discovery of *G. morbida* in Missouri. At this time, Missouri is not considered to have TCD.

Landowners are encouraged not to preemptively harvest walnut trees as a reaction to the discovery of *G. morbida* in our state. However, landowners should keep an eye out for the symptoms of TCD on walnut trees and report any declining pockets of walnut to their local MDC forester. To review photos of the signs and symptoms of TCD on walnut trees or to report possible TCD, please visit [treepests.missouri.edu](http://treepests.missouri.edu). If you have questions about TCD or the recent *G. morbida* detections in Missouri, you can contact the MDC Forest Health Program at [forest.health@mdc.mo.gov](mailto:forest.health@mdc.mo.gov).



***G. morbida* was frequently detected on the fruit-tree pinhole borer, *Xyloborinus saxesenii*, one of six species screened during the research.**

Photo: Pest and Diseases Image Library, Bugwood.org



# Emerald Ash Borer Continues to March Across MO



**Bark blanding on ash trees is often a sign of EAB infestation.**

Photo: MDC, Tyler Cooper

bark and reveals light-colored inner bark, which is highly noticeable. Look for ash trees with bark blanding in late winter or early spring. These blonded trees may not have EAB, but it is certainly worth taking a closer look for this invasive pest. **Please report suspected EAB infestations if the location is in a new county where EAB has not yet been found.**

EAB populations can expand slowly on their own to new areas, but the primary way that EAB spreads over long distances is by hitchhiking on ash firewood. To slow the spread of EAB and other invasive forest pests, don't move firewood. Buy it as close as possible to the location you plan to burn it, or harvest firewood on site, if permitted.

Insecticide options are available to protect healthy, high-value ash trees from EAB. Please see details in the "**Emerald Ash Borer Management Guide for Missouri Homeowners**".

For more information on EAB or to report possible EAB locations, visit [eab.missouri.edu](http://eab.missouri.edu).

**EAB was detected in 17 new counties in 2018.**

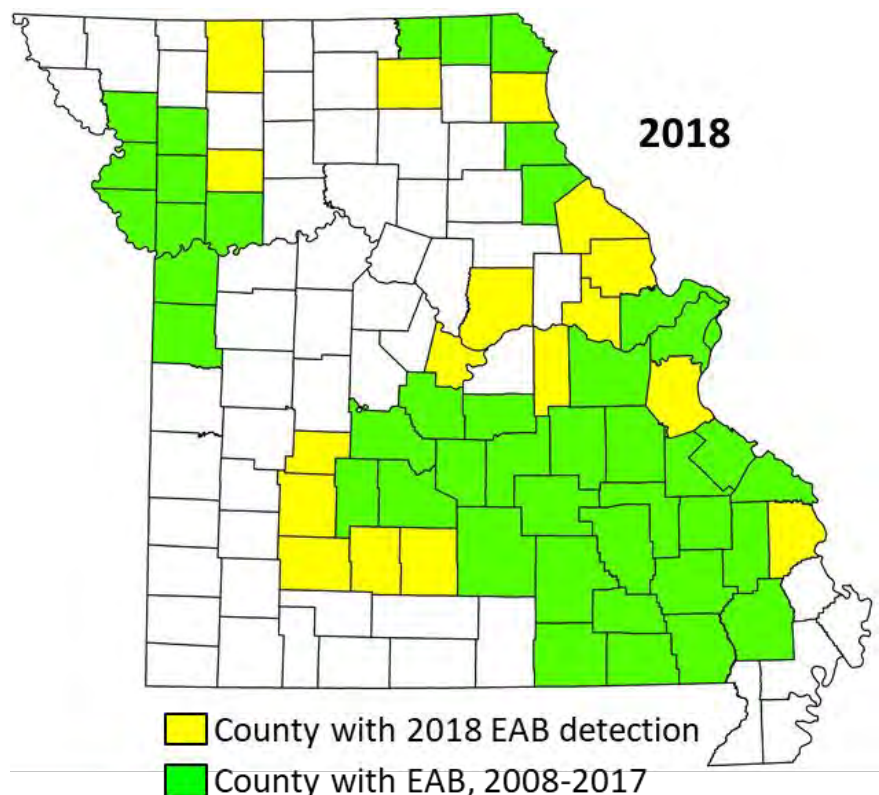
Map: MDC

The emerald ash borer (EAB), *Agrilus planipennis*, is an invasive beetle that has killed millions of ash trees in North America. It was initially discovered in the Detroit, Michigan area in 2002, but EAB likely entered that region at least a decade earlier via wood pallets and crating from China. EAB has now been detected in 35 U.S. states and five Canadian provinces, stretching its range from Manitoba to Texas and Colorado to Maine.

Missouri's first detection of EAB came in 2008 in Wayne County, near Lake Wappapello. By December 2018, 59 Missouri counties and the city of St. Louis are known to have EAB infestations. Seventeen new county detections occurred during 2018: Adair, Caldwell, Callaway, Cape Girardeau, Cole, Gasconade, Greene, Harrison, Hickory, Jefferson, Lewis, Lincoln, Pike, Polk, Warren, Webster, and Wright.

The Missouri Department of Agriculture monitored 272 purple prism traps in 31 counties throughout the state in 2018. Trap locations included high-risk areas like campgrounds and municipal yard waste facilities. EAB was captured on traps in nine counties this year—an indication that the EAB population is on the rise in many areas across the state. Interestingly, a tenth county was also confirmed through trapping...walnut twig beetle trapping, that is! The Polk County EAB detection occurred when a single EAB was found in a walnut twig beetle trap placed at a sawmill.

Seven of the new EAB detections in 2018 were due to reports of bark blanding on ash trees, which is caused by woodpeckers searching for insect larvae inside trees. This feeding activity pops off the trees' outer





# Gypsy Moth Survey: 3 Moths Captured in 2018

The multi-agency Missouri Cooperative Gypsy Moth Program conducted its annual survey to detect the presence of gypsy moth (*Lymantria dispar*) by placing and monitoring 7,430 traps in 54 counties. Three male European gypsy moths were captured statewide in 2018. A single male moth was captured near Branson in Taney County. Two male moths were captured in St. Louis County, each in separate traps, but one capture was located very near where a gypsy moth was found in 2017. Fortunately, such low capture numbers likely mean that this invasive species is not established in St. Louis. We will intensively survey the area next summer to confirm no breeding populations of gypsy moth are present.

Missouri is not known to have any reproducing populations of gypsy moths. It is very easy, however, to transport gypsy moth egg masses to our state accidentally. Travelers returning from gypsy moth-infested states in July and August should examine vehicles and outdoor gear for tan, fuzzy egg masses. Please remove these masses before returning to Missouri.

***Gypsy moth egg masses on a tree trunk.***

*Photo: Karla Salp, WA Dept. of Agriculture, Bugwood.org*



## Japanese Beetle on the Rise in Western MO



***Japanese beetles feeding on aromatic sumac.*** Photo: MDC

For Missouri residents in the central and western parts of the state, the summer of 2018 brought a high number of Japanese beetles. Callers have reported beetle feeding on everything from corn to oaks; favorite food plants are typically linden (basswood), birch, elm, crabapple, sycamore, sassafras, plum, cherry, bald cypress, grape, Virginia creeper, and rose. In some cases, small trees or vines were defoliated in a matter of hours.

Japanese beetles are capable of entirely defoliating mature trees, leaving behind lacy-looking, skeletonized leaves. Healthy, established trees can typically tolerate a heavy amount of feeding damage. However, this damage stresses trees, and multiple years of defoliation could cause long-term tree health issues. You can help your trees by watering them 2-3 times per month during dry times to avoid additional stress from drought. A good rule of thumb is 10 gallons per inch of a tree's diameter.

If your trees suffered extensive Japanese beetle damage in 2018, consider ways to protect them next summer. Keep an eye out for the beetles starting in early to mid-June. Prevent early feeding damage by handpicking beetles off small or newly planted trees. If populations are too high to remove by hand, spray an insecticide labeled to control Japanese beetles on your particular tree species. Repeat, if needed, at labeled intervals. Systemic insecticides, such as those containing imidacloprid, can be applied as a soil drench to protect some types of trees from Japanese beetles (not allowed on linden/basswood trees; follow all label restrictions). However, a large tree can take up to 6 weeks to translocate this chemical from soil to the leaves, so choose an appropriate application date before Japanese beetles arrive. **Many insecticides, including systemic products, are not compatible with trying to maintain a pollinator-friendly yard and should never be used on flowering plants or trees that will attract bees and other pollinators.** For more information on treatment options, check out our **Japanese Beetle Forest Health Alert**.

Drought conditions in July and August can lead to the death of many newly hatched Japanese beetle grubs. The northern half of Missouri experienced drought during those months in 2018, so Japanese beetle populations may be reduced locally in 2019. It is unlikely that winter conditions will be a limiting factor in grub survival; soil temperatures at or below 15°F are needed to kill this cold-adapted species.

# 2018 Oak Issues

## ***Oak Anthracnose***

The University of Missouri Plant Diagnostic Clinic received numerous oak anthracnose samples this summer. Anthracnose of oak species is typically caused by the pathogens *Apiognomonia quercina* and *A. errabunda*. Severity of symptoms depend on weather conditions, timing, growth stage, and species of oak. While many oak species may be infected with anthracnose, white oak (*Quercus alba*) is highly susceptible. Symptoms of anthracnose on white oak include brown spots, leaf and shoot blight, and even distorted leaves with large dead areas. Infection often follows major leaf veins. Anthracnose-infected shoots may develop twig cankers and experience some dieback. Trees with severe anthracnose infection may exhibit a scorched or blighted appearance. Severe infections often follow prolonged cool, wet conditions in the spring. Oak anthracnose is generally not a serious issue for healthy trees; treatments may be warranted if a tree has been severely affected in previous years.



***Anthracnose symptoms on white oak.***

Photo: Joseph O'Brien, USDA Forest Service, Bugwood.org

## ***Oak Shothole Leafminer***

We have seen several oak leaves this summer showing either randomly spaced or distinct rows of holes with smooth edges. These holes were created by a small leaf-mining fly called an oak shothole leafminer (*Japanagromyza viridula*). In early spring, females feed on young leaves by inserting their ovipositors (egg-laying appendage) into leaf tissue and then drinking the resulting leaf juices. As damaged leaves expand, the punctures widen into small holes. Dark areas of brown leaf tissue indicate the presence of oak shothole leafminer larvae. No treatments are necessary as the damage to leaves is mostly aesthetic.



***Shothole leafminer damage on shingle oak.***

Photo: MDC

## ***Have you seen this leaf spot?***

In the late summer and fall of 2018, this unknown leaf spot was noticed on chinkapin oaks throughout the southern half of the state. Striking in appearance, the leaf spot consists of several concentric rings spreading outward from the center. This is referred to as a zonate or target leaf spot and resembles a bull's eye pattern. The spots range widely in size, with some smaller than ½-inch across and others two inches or larger in diameter.

There were many reports this fall, but this is not the first time that a zonate leaf spot has been reported on chinkapin oak in Missouri. Although never confirmed due to a lack of samples, *Cristulariella* (a group of fungi causing zonate leaf spots on other plants) has been proposed as a possible cause. With an abundance of samples this year, the MDC Forest Health Program is working on identifying a pathogen with help from the Missouri Department of Agriculture. Please continue to report this eye-catching leaf spot to [forest.health@mdc.mo.gov](mailto:forest.health@mdc.mo.gov) to help determine its location and abundance in Missouri.



***Mystery zonate leaf spots on chinkapin oak.***

Photo: MDC



# Twig Drop: Who's to Blame?

We frequently receive questions related to twig drop. Homeowners see twigs scattered across their lawns and wonder what is causing the issue. The three most common causes reported in Missouri are twig girdlers, squirrels, and abiotic stress.

## ***Twig Girdlers***

The arrival of fall brings peak activity of twig girdlers, a native longhorned beetle famous for the females' tree-trimming tendencies. Female twig girdlers cut a deep groove around twigs and lay eggs in the portion that will fall. Eventually, twigs break away from the tree, revealing a distinct, smooth cut with a ragged center. Twig girdler larvae develop for nearly a year in the fallen twigs, so destroying this material can help to curb their numbers the following fall. Twig girdlers can use a wide variety of host trees, but most reports are of girdled twigs on pecans, hickories, and persimmons. Damage caused by twig girdlers is rarely an issue for mature trees; insecticides are only recommended for control of twig girdlers on newly planted trees.

## ***Squirrels***

Squirrels chew twigs, buds, and even bark off trees at different times of the year. Much of the damage likely occurs because the squirrels are utilizing the tree as a food source, usually during times when preferred foods like acorns and hickory nuts are scarce. Some tree trimmings are also used as nest-building material. When identifying squirrel damage, look for sharp, angled cuts. It can be difficult to deter squirrels from damaging a tree; try providing alternative foods like corn or sunflower seed during late winter or hanging streamers, beach balls, or fake owls to help scare them away.

## ***Abiotic Stress***

If abiotic stress is to blame, the ends of the fallen twigs are typically rounded and knob-like in appearance. In most cases, no insect, disease, or animal injury is associated with these twigs. When trees become stressed by poor growing conditions (drought, site disturbance, nutrient deficiencies, etc.), they begin to reduce their need for scarce resources by self-pruning. An abscission layer starts to form at the base of a twig, which weakens its connection to the tree. If growing conditions improve during this process, then the partial abscission layer may be callused over by the tree, leaving the twig to continue growing and functioning as usual. As the twig grows longer and develops more leaves, it becomes heavier and places additional strain on the weak connection it has to the tree. Eventually, the twig drops from the tree during a windy day, often with a full set of healthy leaves attached. Use good tree care practices, such as watering during droughts and using proper mulching techniques, when caring for trees suffering from abiotic stress.



**Twig Girdler**

**Squirrels**

**Abiotic Stress**

***Twig girdlers, squirrels, and abiotic stress can all lead to twig drop.***

*Photo: MDC*

# Rapid White Oak Mortality

Significant white oak mortality has been reported throughout Missouri since 2011, with the greatest number of affected sites occurring in the central, east central, and southeast parts of the state. Unlike oak decline, which typically affects mature trees in the red oak group growing on rocky, upper slopes, this mortality disproportionately affects white oak and occurs on sites considered favorable for tree growth. Mortality is most significant along drainages. Affected white oaks often die rapidly; consequently, the phenomenon was named rapid white oak mortality (RWOM). Reports of dead white oak trees peaked in 2012 and continued through 2015. Several new reports of RWOM were received in 2018.

The University of Missouri began a multi-year research investigation in 2014 led by Dr. Sharon Reed to study the factors causing RWOM and how to better predict and manage affected locations. The research, which was funded by the USDA Forest Service, Missouri Department of Conservation, and L-A-D Foundation, is currently in the final stages of funding and reporting. Using 54 research sites on MDC and Mark Twain National Forest lands in east central and southeast Missouri, the research team collected data on site and stand characteristics, measured tree age and growth rates, and identified associated insects and diseases.



**RWOM pocket at Huzzah Conservation Area in Crawford County, MO.** Photo: MDC

At this time, the team's research suggests that tree mortality is affected by soil characteristics and slope position. RWOM tends to be concentrated on the lower half of slopes in soils that widely fluctuate between wet and dry conditions. More mortality was observed on soils that have a higher soil pH (near neutral) and less than 30% clay. Mortality is not significantly related to age, but large dominant overstory white oaks in the 10 to 18-inch size class are most affected. The research also suggests that stocking levels, a measure of the number of trees and their size, may not be related to the amount of death observed.

Investigations of associated insects and diseases resulted in the discovery of *Phytophthora cinnamomi* in several soil samples from Crawford, Shannon, Washington, and Wayne counties. The pathogen was also isolated from the main stem of a white oak in Sainte Genevieve County. *P. cinnamomi* is an exotic root rotting pathogen that is associated with similar white oak mortality patterns in eastern states. In Crawford and Washington counties, a second exotic fungal pathogen, *Diplodia corticola*, was discovered causing stem and branch cankers on several white oaks. Other commonly detected insects and diseases at RWOM sites included several native and non-native species of wood-boring beetles, *Hypoxylon* canker, and *Armillaria* root rot. These pests generally affect stressed

## Timeline of Rapid White Oak Mortality (RWOM) in Missouri

### White Oak Mortality

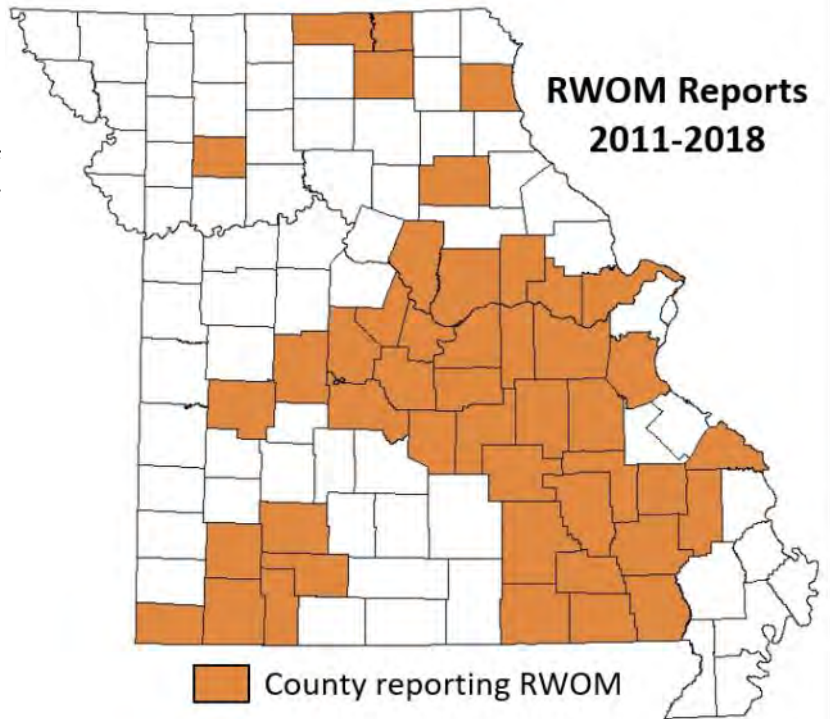


### Weather and Pest Events



and declining trees and aren't typically considered primary causes of tree mortality.

Although there is still a need for further research into RWOM, the University of Missouri investigation suggests that this mortality may be the result of many stressors working together over the course of several years to kill trees. Trees killed by RWOM often decay rapidly and should be salvaged soon after death. Forest managers should consider increasing stand diversity and decreasing percentage of white oaks, particularly on lower slopes and along drainages. Oak regeneration has been observed on affected sites but management of undesirable species may be necessary to maintain an oak component. Good stand management practices are recommended to promote vigor and limit mortality, although they may not prevent RWOM. Landowners and managers are encouraged to report new RWOM events to the MDC Forest Pathologist, [Natalie.Diesel@mdc.mo.gov](mailto:Natalie.Diesel@mdc.mo.gov); (573) 815-7900 x2946.



***Dead white oak (left) with Hypoxylon canker spore mats (stromata) on the lower trunk (right); Morgan County, MO.***  
Photos: MDC



# Herbicide Injury: Not Just a Soybean Problem

If you've been following the news the last several months, you may have heard about some of the herbicide concerns in the Midwest. During the 2017 and 2018 growing seasons, thousands of acres of crops—from soybeans to peaches, grapes, and watermelons—were injured by herbicides. Injury was also reported on many different tree species in both yard and forest settings. Given the recent herbicide product renewals by the US Environmental Protection Agency, it is important to know what herbicide injury looks like on trees and how to report suspected injury to the **Missouri Department of Agriculture**.



## ***What does herbicide injury look like on trees?***

The appearance of herbicide injury symptoms on an individual tree varies based on the tree's species and its relative health, the time of year, and the herbicide used. Herbicide injury symptoms may include curled, cupped, pale, twisted, and/or strap-like leaves. You may also see tight clusters of buds that never fully expand into leaves or full-sized leaves missing most of the leaf tissue between veins. In some cases, the tips of twigs can be twisted and deformed or even killed. New research is also suggesting that accidental herbicide applications to the trunks of newly transplanted or thin-barked trees may be reducing the cold hardiness of tree bark and resulting in long, vertical trunk cracks, often called "winter injury."

***Cupped leaves on redbud is commonly caused by a growth-regulating herbicide.*** Photo: MDC

## ***Which herbicides cause injury on trees?***

From an herbicide perspective, trees are basically giant, broad-leaved weeds so any formula meant to kill these types of plants can certainly injure a tree. Herbicides that commonly damage trees include dicamba, 2,4-D, glyphosate, picloram, triclopyr, and imazapyr.

## ***Can other things cause herbicide-like symptoms on trees?***

Yes—insects, diseases, nutrient imbalances, and even the weather can all cause damage that looks a lot like herbicide injury. Take a closer look at your tree to see if you can find evidence of these issues. You may need a hand lens to see small insects, mites, or disease-causing structures. Consider conducting a soil test to rule out any nutrient deficiencies, especially if you have seen the same symptoms on your tree for at least two growing seasons. Cold spring weather (40 degrees and below) may also impact the development of new leaves, and late spring freezes can even cause expanding tree leaves to curl and deform.

## ***Can I prevent herbicide injury on my trees?***

Yes and no. When applying herbicides on your property, be very careful to prevent direct contact with your trees. Always read the herbicide's label in full and be mindful of wind conditions when spraying. Never use herbicides around tree trunks to kill weeds. Avoid using pelletized lawn care products that contain dicamba or 2,4-D, as these chemicals can damage tree roots and leaves. Remember that herbicide drift can also come from maintenance of nearby rights-of-way or farm fields, so not all herbicide injury on your trees is preventable.



***Twisted and cupped leaves on a hackberry.*** Photo: MDC



### ***What can I do for a tree injured by herbicide?***

Trees typically recover from light herbicide injury, but severe damage may ultimately lead to tree decline and death. It's best to take a wait-and-see approach with herbicide injury—some trees may make a full recovery within a couple of growing seasons. To help trees recover, provide supplemental water 2-3 times per month during dry periods (aim for 10 gallons of water per diameter inch). Watering can also help leach root-active herbicides from the soil. Encourage the growth of fine feeder roots by installing a 3-inch-deep organic mulch ring. Avoid fertilizing injured trees for at least a year so as not to encourage excess growth. Be sure to properly prune dead branches but wait to be sure branches are truly dead before doing extensive pruning.



***Twisted, strap-like leaves on a pin oak.*** Photo: MDC

### ***How do I report suspected herbicide injury?***

The Missouri Department of Agriculture's Bureau of Pesticide Control is responsible for herbicide injury complaints within the state. It is important to submit reports shortly after noticing symptoms of plant injury. You can fill out an online form available at <http://agriculture.mo.gov/plants/pesticides/incidentreport.php>.



***Cupped leaves on a white oak give the appearance of a melting tree (left). A black walnut shows twisted, cupped, and strap-like growth on only the newest leaves (right).*** Photos: MDC



# Yellow-bellied Sapsuckers

Yep, you read that correctly! Yellow-bellied sapsuckers. They *are* real, and while sapsuckers aren't often seen, they do frequently leave behind signs of their tree-drilling activities. Yellow-bellied sapsuckers are small migratory woodpeckers that pass through Missouri in the spring and fall, with some individuals hanging around the southern half of the state through winter. Sapsuckers are aptly named as they create small round or square holes in trees called sap wells from which they lick tree sap and insects. To learn more about this fascinating bird species, visit [the species page on Cornell Lab's All About Birds website](#).

**Top:** Sapsuckers frequently drill round holes in thin-barked trees. Holes are often in groups or rows, distinguishing them from the random holes of insect borers. Photo: MDC

**Bottom:** Some sapsucker wells are nearly rectangular in shape. Healthy trees typically callus over these injuries in a few years. Photo: Amy Childs



## Facebook Campaign: Don't Move Firewood!

In 2018, the Missouri Department of Conservation used Farm Bill funding provided by the USDA to conduct an advertising campaign to help discourage the long-distance movement of firewood in Missouri. Part of this project included advertisements on Facebook that ran from April through June. During that period, over 1.9 million impressions occurred, garnering nearly 4,500 reactions from Missourians concerned about the health of our state's trees. This advertising campaign is part of a multi-year invasive forest pest outreach effort supported by the Missouri Invasive Forest Pest Council.

Missouri is currently under a statewide quarantine that restricts the movement of hardwood firewood out of the state as well as the importation of hardwood firewood from some states (check with the [Missouri Dept. of Agriculture](#) for details). At this time, it is legal to move firewood within the state, but officials strongly recommend not moving firewood more than 50 miles from where it was harvested to reduce the risk of spreading invasive pests. **Moving firewood less than 10 miles from its origin is best.** For more information, visit [treepests.missouri.edu](#) and [DontMoveFirewood.org](#).

**Missouri Dept. of Conservation**  
Apr 5 at 2:22 PM • 🌐

Protect the Trees You Love From Tree-killing Bugs

**TREE-KILLING BUGS & DISEASES**

Emerald Ash Borer  
Asian Long-horned Beetle  
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They give you shade. Th...  
[dontmovefirewood.org](#) **LEARN MORE**

**Firewood advertisement on Facebook.**

Photo: Learfield News

**Questions?** Contact your local Forester with the Missouri Department of Conservation.

**Find contact information for your county at:**  
**[mdc.mo.gov](#)**

The Missouri Department of Conservation is an equal opportunity provider.

An electronic copy of this document can be found at [mdc.mo.gov](#) by searching “forest health news.”

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